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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

LERNER, MARTIN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2654

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/080,059

Applicant(s)

BI ET AL.

Examiner

Martin Lerner

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 to 7, 9 to 16, 18 to 25, 27 to 30, and 32 to 34 is/are allowed.
- 6) ☒ Claim(s) 8, 17, 26, 31 and 35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8, 17, 26, 31, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Boss et al.* in view of *Matsumoto*.

Concerning independent claims 8, 17, and 26, *Boss et al.* discloses a method, program, and circuitry for performing the steps of:

“receiving signals including: a pitch signal comprising a representation of fundamental frequency of the input speech signal” – pitch detector 56 receives each phoneme pattern on line 52 from speech analyzer 48 and estimates the pitch (fundamental frequency F_0) of the phoneme represented by the received phoneme pattern (column 6, lines 21 to 43: Figure 4);

“receiving user selection of at least one of multiple voice fonts each specifying a [manner of modifying the formants signal and] a different manner of modifying the pitch signal” – the data stream from encoder 68 can include the designated input font and a designated output font, or voice font IDs identifying input and output voice fonts; the designated output voice font identifies the voice font which should be used when playing

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back or reconstructing the original speech signal which was received on line 44 (column 7, lines 23 to 45: Figure 4); synthesizer 98 adjusts or modifies the relative pitch value provided on signal 90; different voice fonts can have different spacings between quantized levels, and different average pitches (frequencies) (column 8, lines 2 to 63: Figure 5);

“modifying the received signals as specified by the selected voice font” – decoder 84 detects the voice fonts or voice font IDs received on line 81; decoder 84 selects the designated output voice font received on line 81 for use in speech decoding and reconstruction by outputting the corresponding voice font ID on line 86; synthesizer 98 receives voice font IDs for the speech sample over line 86 and selects the voice font corresponding to the designated output voice font to use as a dictionary for speech reconstruction (column 8, lines 2 to 63: Figure 5);

“providing an output of the received signals as modified” – the modified output phonemes are output from synthesizer 98 on line 102; D/A converter 104 converts the digitized speech signal received on line 102 to an analog speech signal output on line 106; analog speech signal on line 106 is input to speaker 108 for output as audio which can be heard (column 9, lines 16 to 21: Figure 5).

Concerning independent claims 8, 17, and 26, the only elements omitted by *Boss et al.* are “receiving signals including: a formants signal representative of an input speech” and “receiving user selection of . . . a manner of modifying the formants signal”. *Boss et al.* discloses a conventional way of modifying a speech signal with a voice font through parameters including pitch, duration, and amplitude, but omits

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modifying a speech signal through formants. However, formants are a well known characteristic of a speech signal that represent the sound of vocal tract harmonics. *Matsumoto* teaches a formant converting apparatus modifying a singing voice to emulate a model voice. Specifically, an analyzing section sequentially analyzes a collected singing voice to extract therefrom actual formant data representing the resonant characteristics of a singer's own vocal organ, and a sequencer section operates in synchronization with progression of the singing voice for sequentially providing reference formant data which indicates a vocal quality of a model voice which is arranged to match the progression of the singing voice. (Column 1, Line 60 to Column 2, Line 11) The objective is to provide a karaoke apparatus with a voice signal converting apparatus that alters the voice quality as well as the pitch frequency of a karaoke singer's voice to improve pleasantness to the ear. (Column 1, Lines 29 to 53) It would have been obvious to one having ordinary skill in the art to analyze a voice signal to receive a formants signal representative of an input speech and modify the formants signal as taught by *Matsumoto* in the speech encoding and speech decoding method with voice fonts of *Boss et al.* for the purpose of providing a voice signal converting apparatus that alters the voice quality as well as the pitch frequency to obtain a pleasant singer's voice for karaoke.

Concerning independent claims 31 and 35, *Boss et al.* further discloses a communications device, comprising:

“a transceiver coupled to an antenna” – the data stream output from encoder 68 is transmitted to a remote user or addressee via transmission medium 74; transmission medium 74 can be a wireless communications link (column 7, lines 45 to 53: Figures 4 and 5); implicitly, a wireless communications link requires an antenna to transmit and receive the data stream;

“a speaker” – a computer system implementing speech encoding includes speaker 126 for outputting audio (column 9, lines 46 to 64: Figure 6);

“a microphone” – a computer system implementing speech encoding includes microphone 128 for inputting speech (column 9, lines 46 to 64: Figure 6);

“a user interface” – personal computer system 120 includes monitor 124 for displaying text and graphics, a keyboard 130, and a mouse 132 (column 9, lines 46 to 64: Figure 6);

“a manager coupled to components including the transceiver, speaker, microphone, and user interface to manage operation of the components” – HDD 136 stores an operating system, such as Windows 95[®] and one or more application programs (column 9, line 65 to column 10, line 9: Figure 6); implicitly, an operating system manages operation of components.

Allowable Subject Matter

3. Claims 1 to 7, 9 to 16, 18 to 25, 27 to 30, and 32 to 34 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

Regarding independent claims 1, 10, 19, 28, and 32, the prior art does not disclose or suggest a method and apparatus for speech signal conversion, where a voicing signal is used in addition to pitch, formants, and gain, to synthesize a converted speech signal with voice fonts.

Regarding independent claims 9, 18, 27, 29, 30, 33, and 34, the prior art does not disclose or suggest a method and apparatus for speech signal conversion, where linear predictive coding yields a formants output and a residual signal, in addition to a voicing signal, pitch, formants, and gain, to synthesize a converted speech signal with voice fonts.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
10/25/04

A handwritten signature in black ink, appearing to read "Martin Lerner", written over a horizontal line.

Martin Lerner
Examiner
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